ONTARIO MINISTRY OF ENVIRONMENT
36936000023224

1970

OPERATING SUMMARY

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ONTARIO WATER RESOURCES COMMISSION

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CONISTON

water pollution control plant

TD
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1970
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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
367
.A56
C665
1970

Coniston : water pollution
control plant.

81279

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional. operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.

D McTavish

D.S. Caverly,
General Manager.

D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

Environment Ontario
[illegible]
Etobicoke, Ontario M9P 3V6
Canada

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TD
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Regional Supervisor
P.J. Osmond

Operations Engineer
R. Kauppinen

135 St. Clair Avenue West
Toronto 195

CONISTON

water pollution control plant

operated for

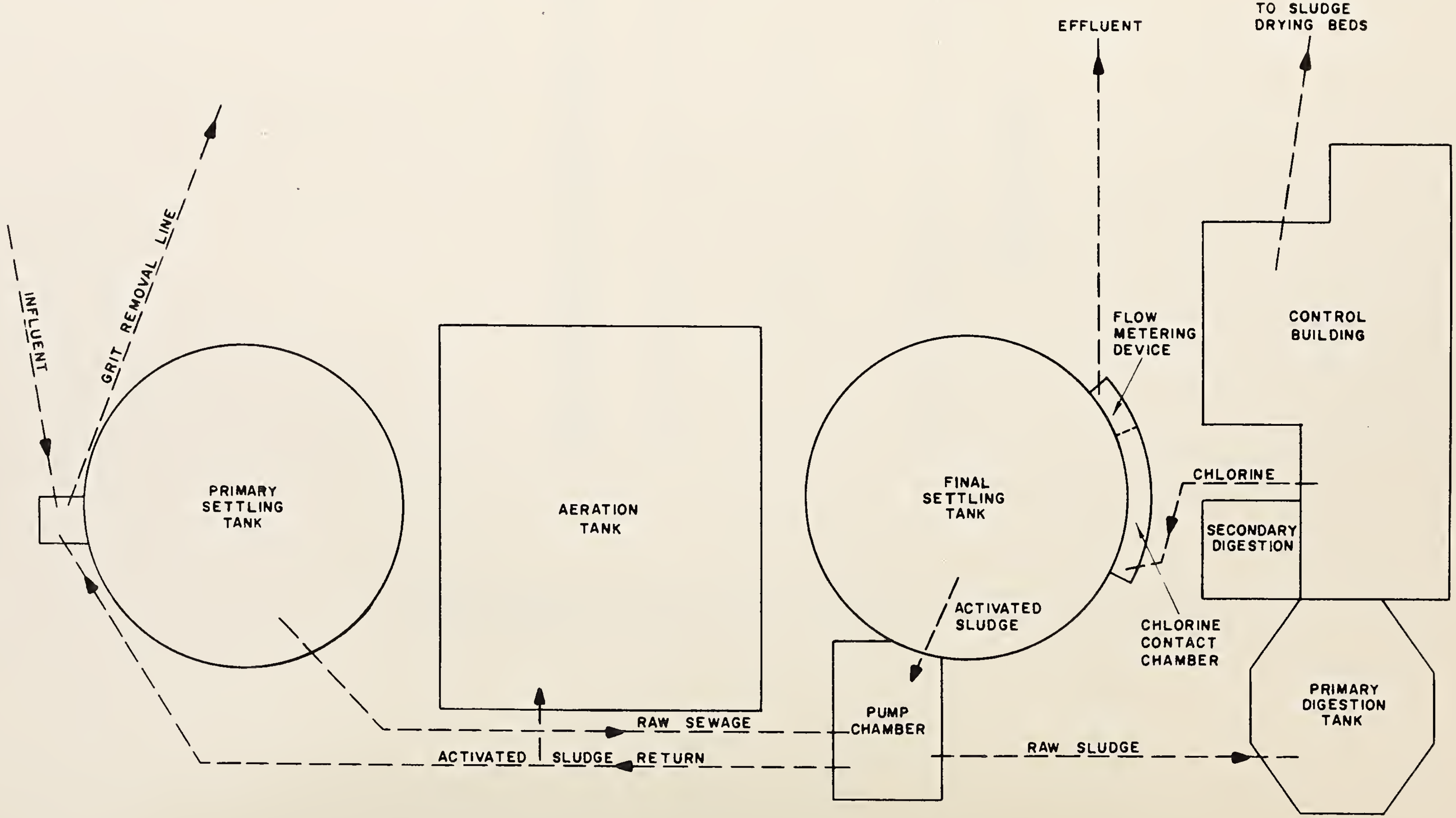
THE TOWN OF CONISTON

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY

FLOW CHART


INFLUENT
GRIT REMOVAL LINE
PRIMARY SETTLING TANK
AERATION TANK
RAW SEWAGE
ACTIVATED SLUDGE RETURN
FINAL SETTLING TANK
ACTIVATED SLUDGE
PUMP CHAMBER
RAW SLUDGE
EFFLUENT
FLOW METERING DEVICE
CHLORINE
CHLORINE CONTACT CHAMBER
SECONDARY DIGESTION
CONTROL BUILDING
TO SLUDGE DRYING BEDS
PRIMARY DIGESTION TANK

DESIGN DATA

PROJECT NO.	2-0008-57	TREATMENT	Activated Sludge
DESIGN FLOW		DESIGN POPULATION	2,500
Primary	0.260 mgd		
Secondary	0.150 mgd		
BOD - Raw Sewage	200 mg/l	SS - Raw Sewage	250 mg/l
- Removal	93%	Removal	93%

PRIMARY TREATMENT

Screening & Grit Removal

- in influent chamber

Primary Sedimentation

Type: Neco with helical scraper
Size: One 24' dia x 5.7' (18,400 gal)
Retention: 2.94 hr
Loading: Surface, 332 gal/ft^2/day
(@ 0.26 mgd) Weir, 1,700 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Mechanical aeration, single-pass
Size: One 29' x 29' x $15\frac{1}{2}$' (55,800 gal)
Retention: 8.9 hr

Aerator

Type: Ames-Crosta
Size: One 6' dia

Secondary Sedimentation

Type: Ames-Crosta Type F
Size: One 28' dia x $6\frac{1}{2}$'
Retention: 4 hr
Loading: Surface, 572 gal/ft^2/day
(@ 0.15 mgd) Weir, 720 gal/ft/day

CHLORINATION

Type: W & T Type A678

Chlorine Contact Chamber

Retention: 10 min

OUTFALL

- 10" Transite to creek

SLUDGE HANDLING

Digestion System

Type: Two-stage

Primary --
One concrete fixed roof octagonal tank with 12" Ames-Crosta screw pump
Size: 19' 3" x 14' swd (4640 ft^3 or 29,000 gal)

Secondary --
One concrete tank with plank roof
Size: 10' x 10' x 8' swd (920 ft^3 or 5,700 gal)

Drying Beds

Six beds 20' x 30'

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	.23	—	6.82	—
High	.59	June	9.62	May
Low	.01	January	5.01	August

GENERAL

The project consists of a 150,000 gallon per day secondary treatment plant and a collector system which includes five lift stations. The project is operated by a chief operator who is assisted by part-time help.

The flows to the plant exceeded the design capacity most of the time. The firm of Canadian Mitchell Associates Limited was actively involved in preparing plans and specifications for the expansion of the treatment facilities and improvements to the collector system.

EXPENDITURES

The total operating cost in 1970 was $19,482.65 compared to $18,073.00 in 1969. The increase was mainly in the payroll and repairs and maintenance items and was due to increased maintenance at the project.

The cost per million gallons treated was $237.73 compared to $257.42 in 1969.

PLANT FLOWS and CHLORINATION

A total of 81.95 million gallons was treated. This represents an average daily flow for the year of 230,000 gallons compared to 194,000 in 1969 or an increase of approximately 17 percent. The design flow of 150,000 gallons per day for secondary treatment was exceeded approximately 84 percent of the time. The final effluent was chlorinated from May to October. A total of 2750 pounds of chlorine was used at an average dosage of 7.4 mg/l.

PLANT EFFICIENCY

The raw sewage had an average concentration of 191 mg/l BOD and 145 mg/l suspended solids. The final effluent had an average concentration of 63 mg/l BOD and 45 mg/l suspended solids.

The average reduction in BOD was 67% and in suspended solids was 69%, both of which are less than the reduction normally expected for secondary treatment.

The concentrations in the final effluent exceeded the OWRC objectives of 15 mg/l for both BOD and suspended solids for plants with secondary treatment.

A total of 645 cubic feet of grit was removed at an average of 7.9 cubic feet per million gallons treated. This amount indicates serious infiltration and/or combined sewers.

AERATION

The primary effluent had an average concentration of 152 mg/l BOD and 86 mg/l suspended solids. The average concentration of the mixed liquor suspended solids was 2150 mg/l. The average loading on the aeration section was 28 pounds of BOD per 100 pounds of MLSS or an F/M ratio of 0.28.

SLUDGE DIGESTION and DISPOSAL

The quantities of raw sludge and digested sludge are estimated since there are no measuring devices. An estimated 160,300 gallons of raw sludge was pumped to the digester and 156,300 gallons of digested sludge was removed from the digester to the drying beds. A total of 425 cubic yards of dewatered sludge was removed from the drying beds.

CONCLUSIONS

The flows exceeded the design capacity 84 percent of the time resulting in a final effluent which did not meet the OWRC objectives for secondary treatment. The new expanded facilities will provide the required additional capacity and an improved quality final effluent.

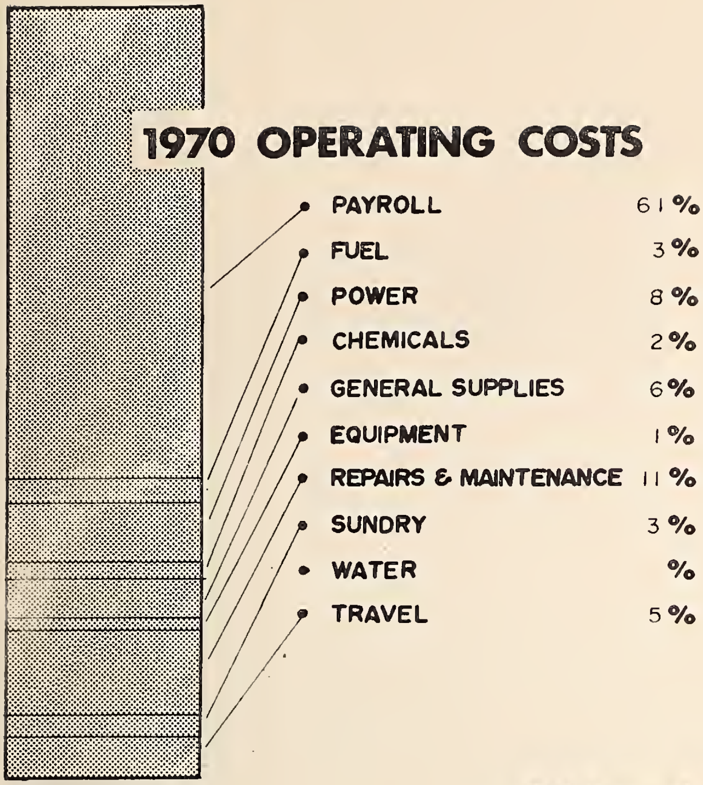
PROJECT COSTS

NET CAPITAL COST (Final)	$468,190.39
DEDUCT - Portion financed by CMHC/MDLB (Final)	-
Long Term Debt to OWRC	$468,190.39
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	$143,494.46

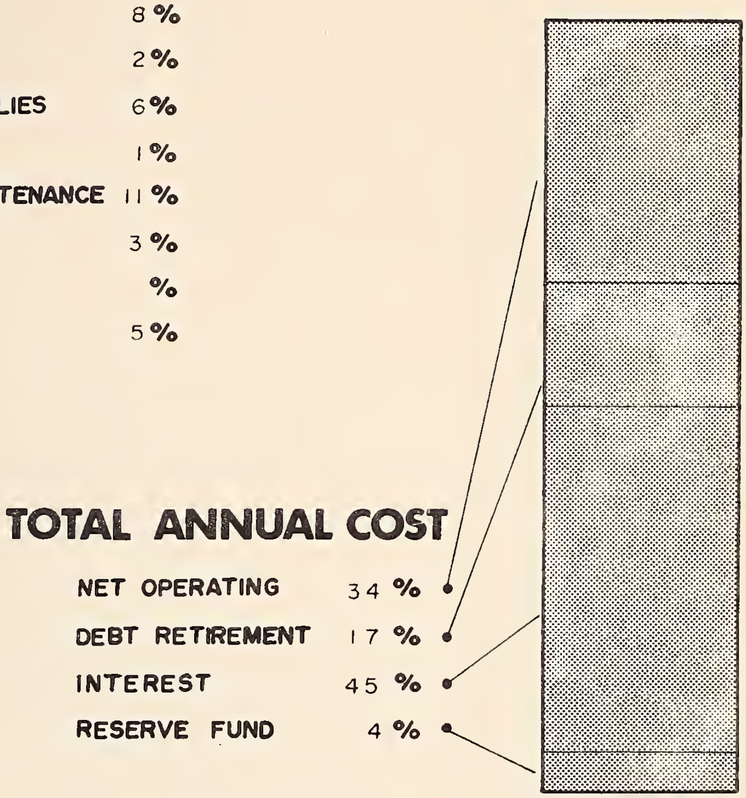
Net Operating	$ 19,616.05
Debt Retirement	9,448.00
Reserve	2,602.32
Interest Charged	26,230.94
TOTAL	$ 57,897.31

RESERVE ACCOUNT

Balance @ January 1, 1970	$ 21,135.75
Deposited by Municipality	2,602.32
Interest Earned	1,427.54
	$ 25,165.61
Less Expenditures	-
Balance @ December 31, 1970	$ 25,165.61



1970 OPERATING COSTS



TOTAL ANNUAL COST

Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	63.139	$11,578.81	$183.29	11 cents
1967	69.296	13,350.51	192.66	13 cents
1968	72.488	14,885.11	205.35	17 cents
1969	70.21	18,073.73	257.42	13 cents
1970	81.95	19,482.65	237.73	20 cents

MONTHLY OPERATING COSTS

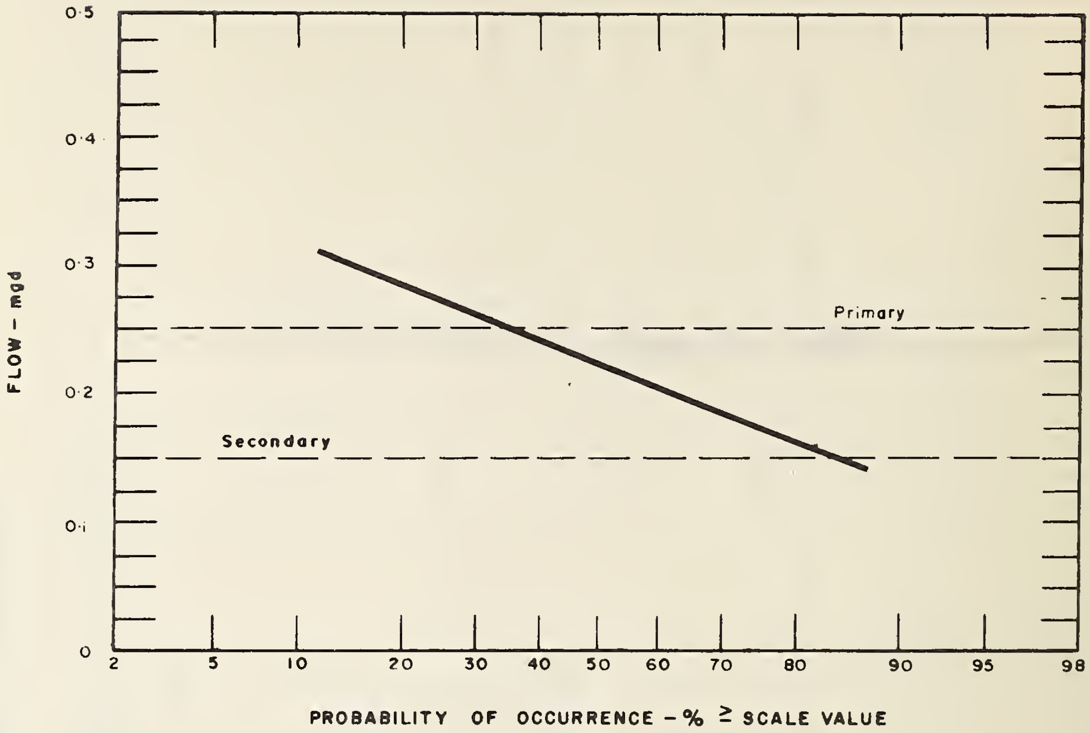
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	1478.70	954.18	204.41	23.19	171.03	-	13.90	-	111.99	-	-	-
FEB	1420.17	703.56	75.62	77.64	181.85	-	121.59	-	144.69	43.06	-	72.16
MAR	1467.38	708.55	395.92	31.63	134.43	-	51.55	-	73.58	5.00	-	66.72
APR	1650.29	879.97	221.85	57.71	167.82	-	64.52	-	133.15	22.39	-	102.88
MAY	1834.16	880.11	106.35	26.24	155.59	290.59	51.67	-	219.85	18.17	-	85.59
JUNE	1149.47	751.86	-	81.00	166.64	-	30.05	-	-	51.12	-	68.80
JULY	1767.09	733.40	254.43	-	97.83	-	330.89	-	211.00	36.34	-	103.20
AUG	2139.34	971.52	294.89	-	117.01	-	-	-	456.77	213.07	-	86.08
SEPT	1395.34	631.39	239.98	-	117.60	-	70.40	-	72.03	196.42	-	67.52
OCT	1417.59	716.95	210.99	47.95	75.26	-	155.30	-	(5.75)	27.31	-	189.58
NOV	1559.44	780.89	216.80	58.47	132.84	87.18	32.95	-	124.99	18.60	-	106.72
DEC	2203.68	654.36	211.32	177.93	107.87	87.18	154.32	76.57	610.16	48.54	-	75.43
TOTAL	19482.65	9366.74	2432.56	581.76	1625.77	464.95	1077.14	76.57	2152.46	680.02	-	1024.68

BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE

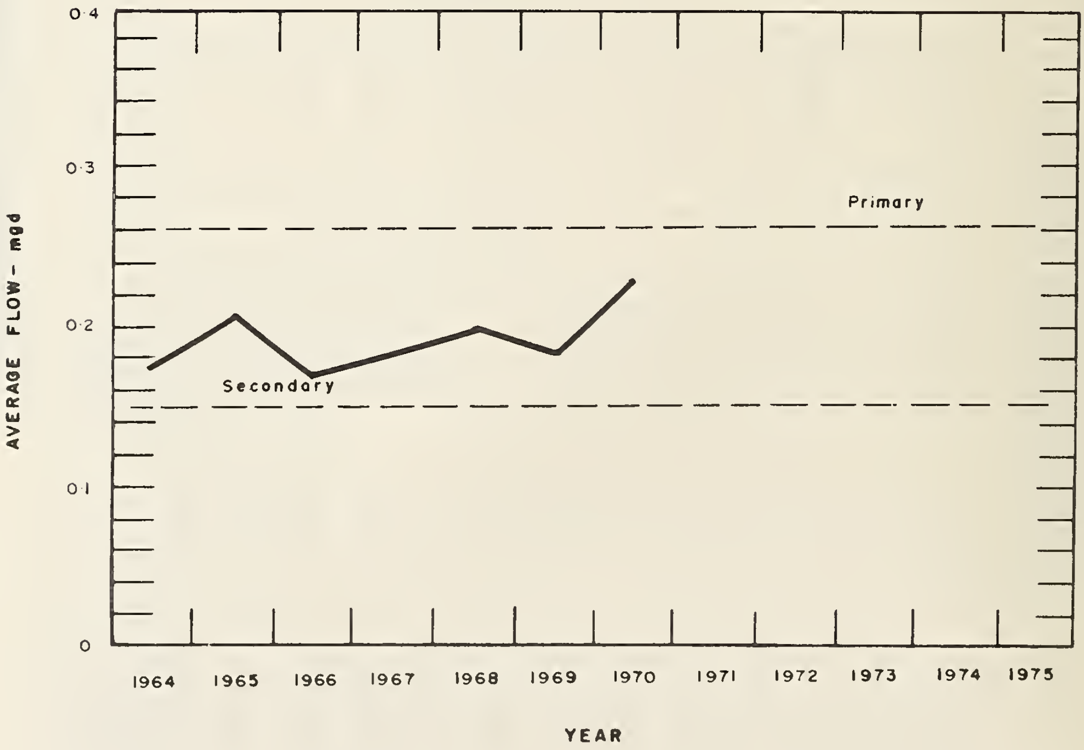
Note: Total does not include year-end adjustments.

PROCESS DATA



FLOWS

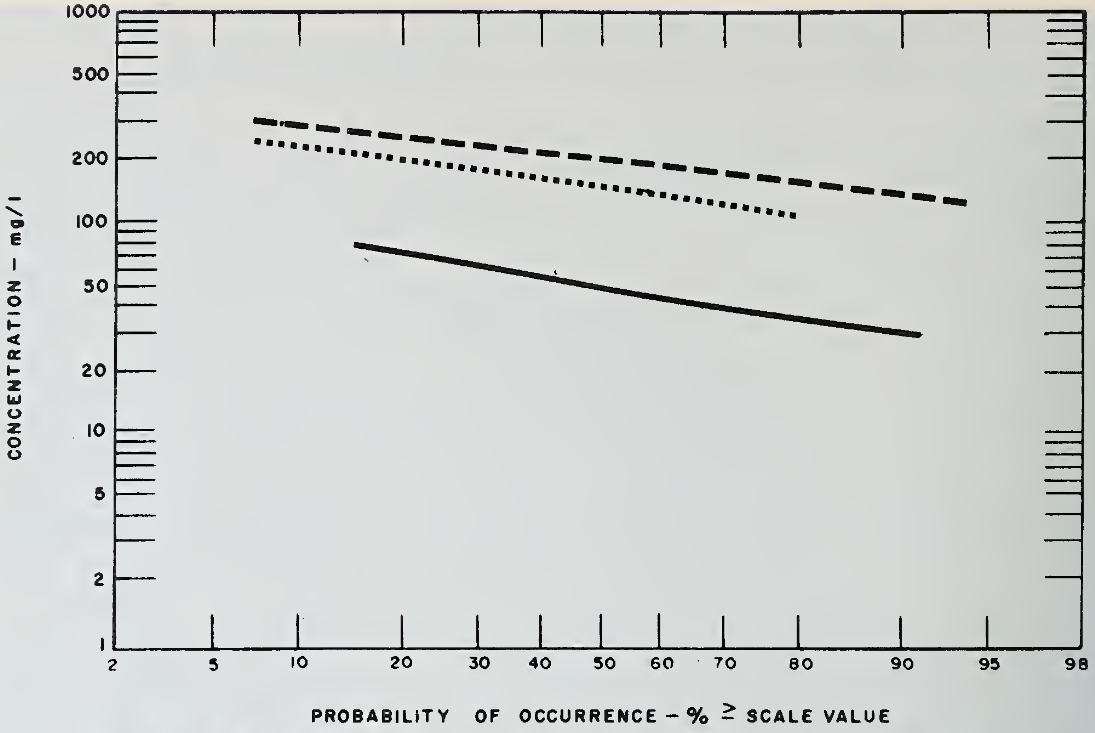
NOMINAL CAPACITY — — —



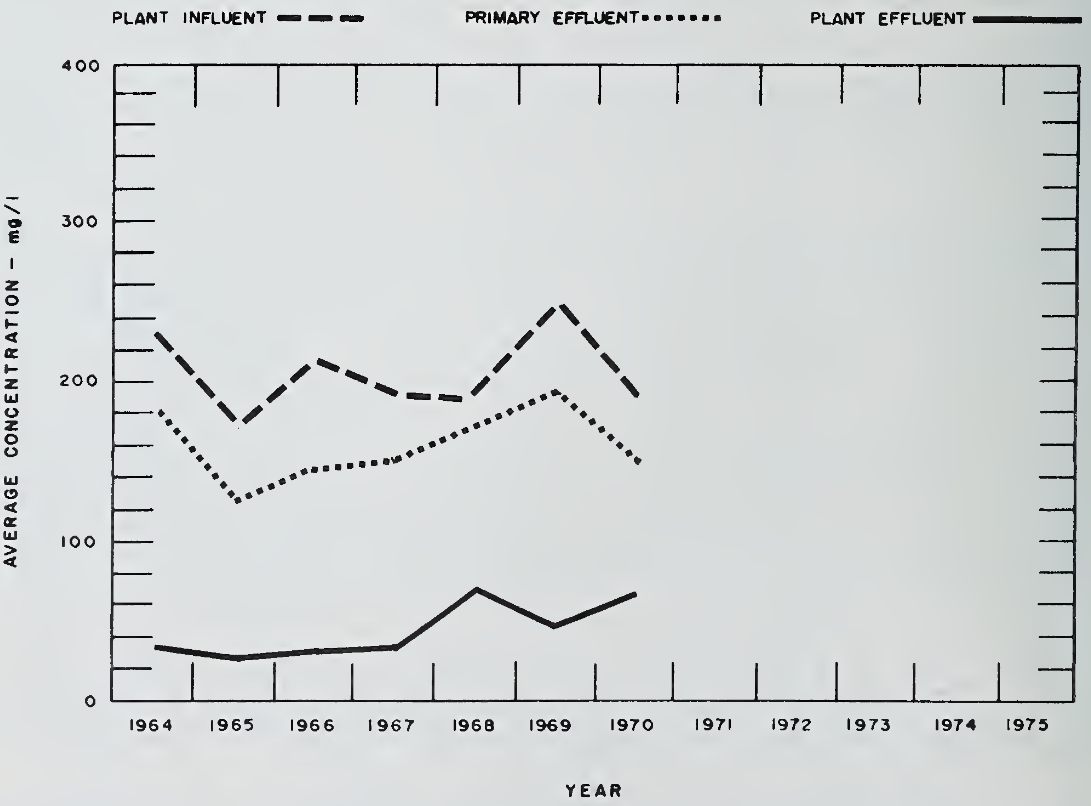
PLANT FLOWS and CHLORINATION

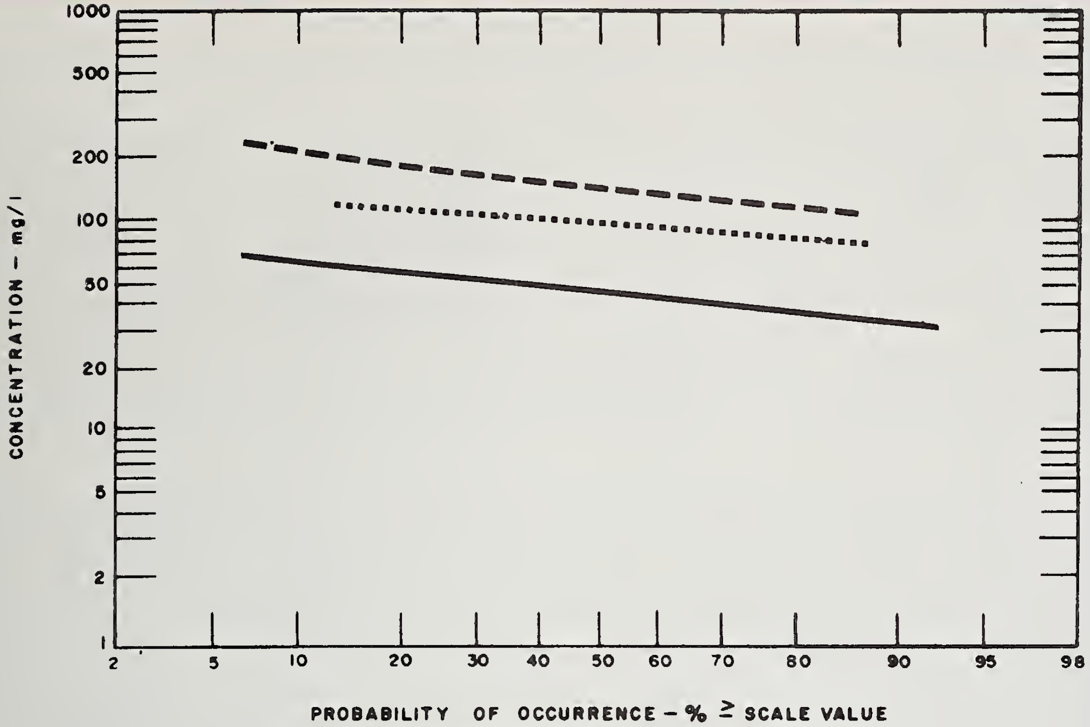
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	5.26	.17	.20	.01	0	0
FEB	5.21	.19	.25	.14	0	0
MAR	6.61	.21	.35	.04	0	0
APR	9.93	.33	.47	.23	0	0
MAY	9.62	.31	.50	.22	560	6.1
JUNE	7.04	.24	.59	.10	600	8.5
JULY	6.51	.21	.29	.16	490	7.5
AUG	5.01	.17	.21	.08	460	9.3
SEPT	6.73	.22	.35	.11	450	6.7
OCT	6.66	.22	.34	.09	190	6.5
NOV	7.19	.23	.32	.19	0	0
DEC	6.18	.20	.35	.16	0	0
TOTAL	81.95	-	-	-	2750	-
AVERAGE	-	.23	-	-	510	7.4

Chlorination period - May 9 - October 13



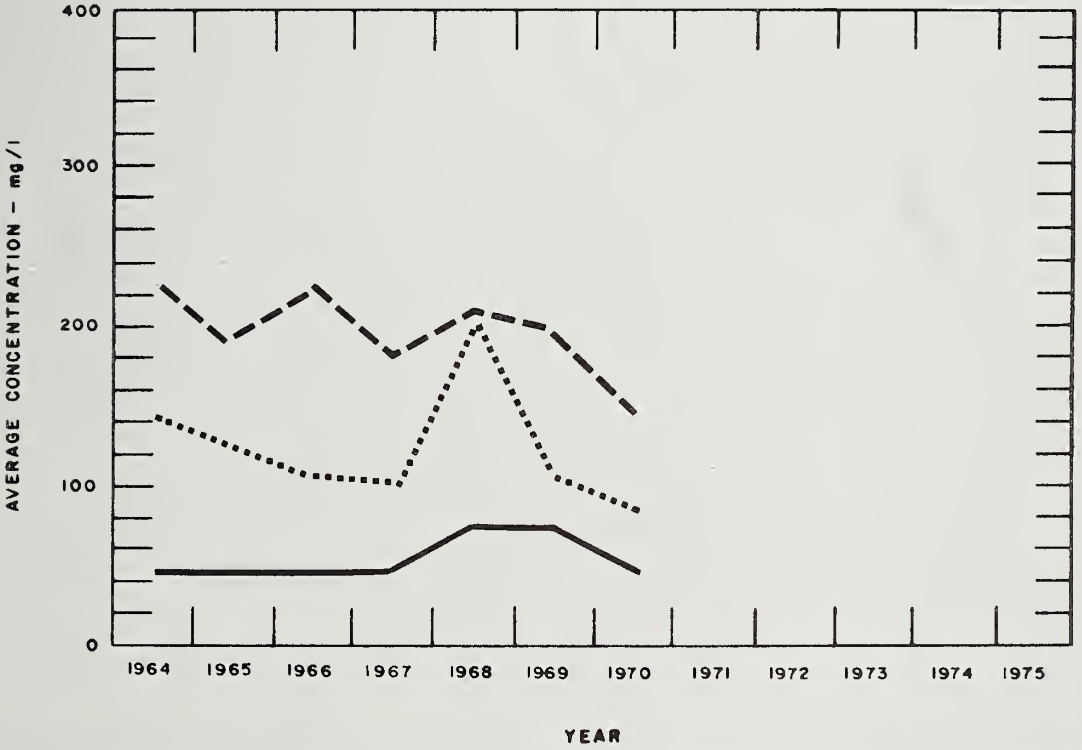
BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS

PLANT INFLUENT ▬ ▬ ▬ PRIMARY EFFLUENT•••••• PLANT EFFLUENT ▬▬▬



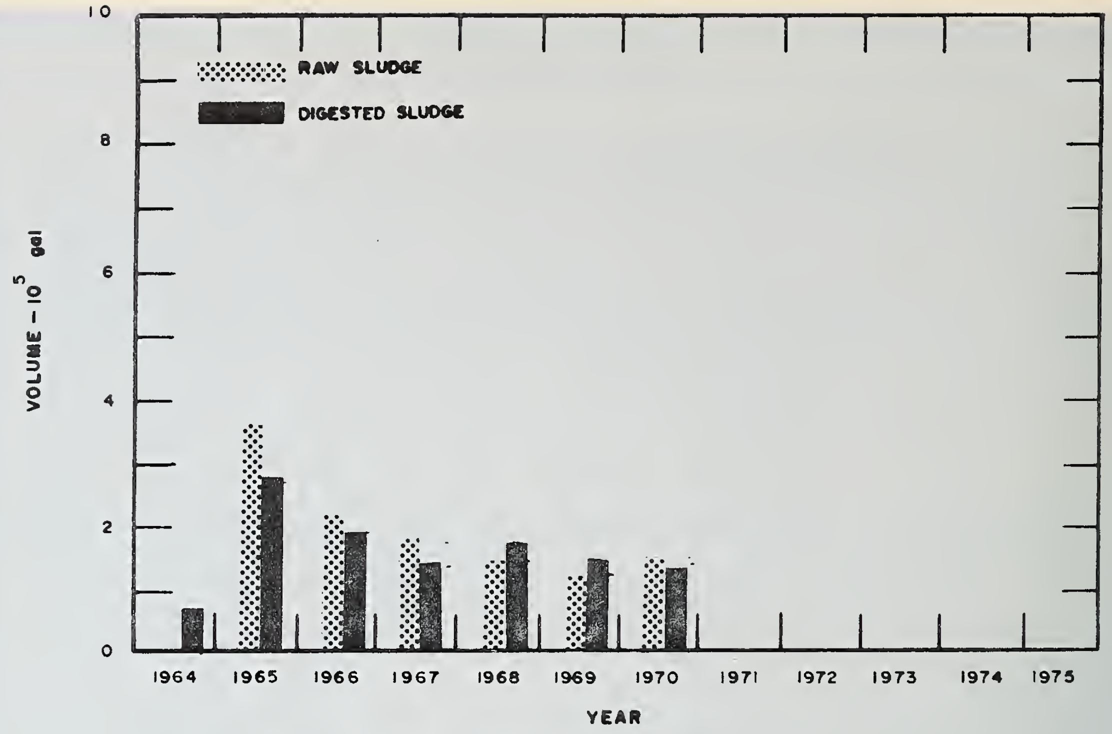
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10^3 pounds	n	mg/l	n	mg/l	%	10^3 pounds	cu ft
JAN	1	180	1	140	22	2.1	1	120	1	35	71	4.5	60
FEB	0	-	0	-	-	-	0	-	0	-	-	-	45
MAR	1	190	1	65	66	8.2	1	100	1	65	35	2.3	60
APR	1	170	1	46	73	12.3	1	105	1	45	57	6.0	45
MAY	0	-	0	-	-	-	0	-	0	-	-	-	15
JUNE	0	-	0	-	-	-	0	-	0	-	-	-	75
JULY	1	150	1	26	83	8.1	1	110	1	35	68	4.9	60
AUG	2	270	2	57	79	10.7	2	165	2	50	70	5.8	45
SEPT	1	150	1	30	80	8.1	1	150	1	60	60	6.0	75
OCT	2	185	2	39	79	9.7	2	190	2	38	80	10.1	75
NOV	2	200	2	63	69	9.9	2	160	2	43	73	8.4	45
DEC	1	140	1	40	71	6.2	1	130	1	35	73	5.9	45
TOTAL	12	-	12	-	-	-	12	-	12	-	-	-	645
AVERAGE	-	191	-	63	67	8.3	-	145	-	45	69	6.0	53

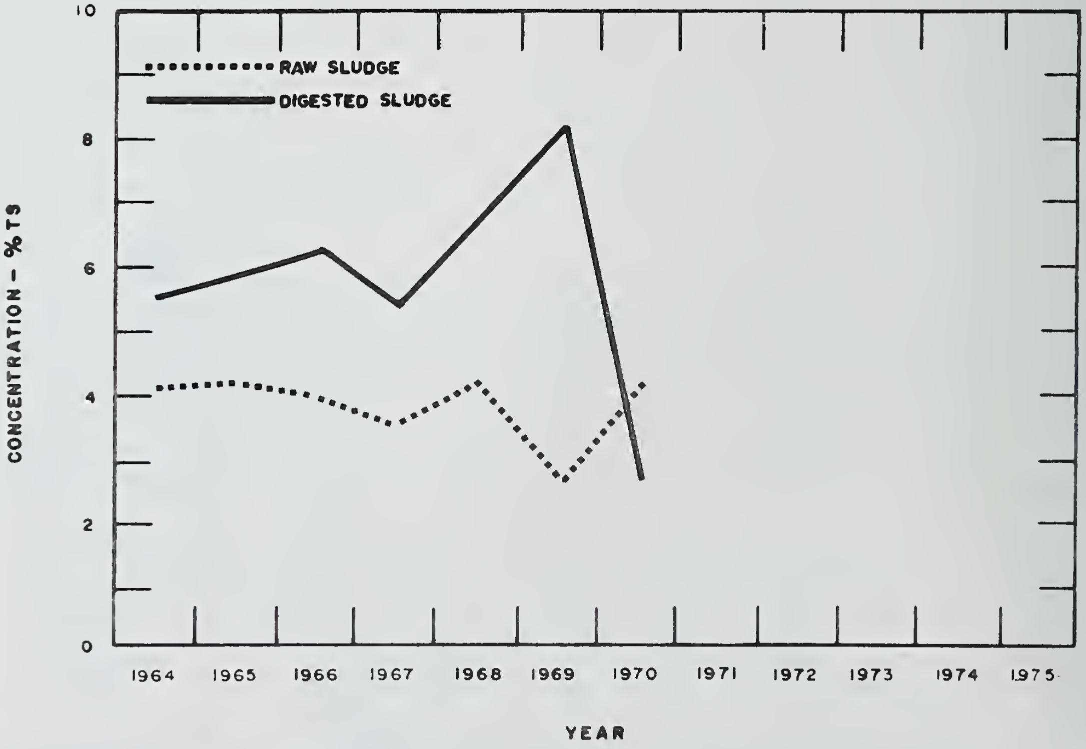
NOTE – n is the number of samples taken

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		M L S S CONCN mg/l	F/M lb B O D / lb MLSS	AIR USED 1000 cu ft / lb B O D	WASTE SLUDGE lb/DAY
		B O D mg/l	S S CONCN mg/l	B O D mg/l	S S CONCN mg/l				
JAN	.17	170	115	140	35	1900	.26	-	-
FEB	.19	-	-	-	-	-	-		
MAR	.21	180	85	65	65	3320	.20	-	-
APR	.33	120	80	46	45	-	-	-	-
MAY	.31	-	-	-	-	-	-	-	-
JUNE	.24	-	-	-	-	-	-	-	-
JULY	.21	100	60	26	35	2330	.16	-	-
AUG	.17	240	95	57	50	1490	.48	-	-
SEPT	.22	130	100	30	60	-	-	-	-
OCT	.22	160	80	39	38	2460	.25	-	-
NOV	.23	142	80	63	43	1800	.33	-	-
DEC	.20	130	80	40	35	1780	.26	-	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.23	152	86	56	45	2150	.28	-	-


RAW SLUDGE
DIGESTED SLUDGE
VOLUME – 10^5 gal
10
8
6
4
2
0
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
YEAR

DIGESTION


RAW SLUDGE
DIGESTED SLUDGE
CONCENTRATION – % TS
10
8
6
4
2
0
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
YEAR

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^3 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10^3 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10^3 gal	TOTAL SOLIDS %	DEWATERED cu yd	LIQUID cu yd
JAN	13.5	2.6	75	12.0	1.9	56	-	.2	-	-
FEB	9.3	5.1	76	7.5	.3	58	-	-	-	-
MAR	9.3	4.5	67	8.0	.3	63	-	.1	-	-
APR	10.5	4.2	68	12.0	.6	61	-	.3	-	-
MAY	14.2	-	-	15.3	-	-	-	-	215	-
JUNE	16.2	-	-	25.0	-	-	-	-	60	-
JULY	14.8	2.6	72	18.0	3.4	62	-	.2	55	-
AUG	12.0	5.7	51	13.0	5.2	60	-	3.5	95	-
SEPT	14.5	6.7	60	11.0	2.4	50	-	-	-	-
OCT	13.8	-	-	11.5	-	-	-	-	-	-
NOV	15.1	2.6	68	9.0	7.1	44	-	.3	-	-
DEC	17.1	2.5	-	14.0	4.4	-	-	-	-	-
TOTAL	160.3	-	-	156.3	-	-	-	-	425	-
AVERAGE	13.4	4.1	67	13.0	2.8	57	-	.7	-	-

Date Due

ONTARIO WATER RESOURCES COMMISSION
DIV. OF PLANT OPERATIONS.
TD 227/C66/W38/1970/MOE
CONISTON -
WATER POLLUTION CONTROL PLANT

1970

DATE	c 1 ISSUED TO askf

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Ontario Water Resources Co
Coniston water
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Environment Ontario
Etobicoke, Ontario M9P 3V6
Canada

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367
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Coniston : water
control plant.
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Water management in Ontario